WORKing papers in Management Science

Determinants of small enterprise efficiency

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1. Summary of the entire scope of the book

The monograph is the result of many years of studies on the issue of business efficiency. The research procedure adopted is reflected in the layout of the book, which consists of: three chapters, an introduction, an introduction to the conclusion and a bibliography.

The first chapter contains the characteristics of enterprises in the SME sector, with particular emphasis on the individuality of small enterprises, their representative features and the specifics of their management. It shows success as the desired result of managing a small business on the way to building efficiency.

In the second chapter, the issue of organisational efficiency as a determinant of the success of a small organisation is discussed. Consideration has been given to the ordering of its three components: manufacturing efficiency, effectiveness, and economic efficiency. Various approaches to efficiency found in the source literature are presented and interpreted. The types of organisational efficiency are discussed and its dimensions are presented.

The third chapter contains the theoretical bases for the efficiency of small enterprises, which are the substrate for building the model. It presents measures to assess the efficiency of these enterprises. The factors shaping the efficiency of small enterprises are distinguished and described, and an attempt is made to determine their typology and aggregation in various systems. Business objectives are presented as the overriding basis for building the efficiency of a small organisation. The issue of the economic efficiency of small enterprises is presented. The dilemmas concerning their growth and development were discussed, treating growth as a measure of manufacturing efficiency and development as a measure of effectiveness. The issue of efficiency management in a small enterprise is presented from the perspective of results, growth and development. This chapter also contains detailed model solutions related to the adopted methodology of research on the efficiency of small enterprises. The research was carried out on a sample of 455 small business owners throughout Poland in 2018. (The aim was to ensure the transparency of research material with the same environmental parameters). The chapter also contains the final conclusions of the study. As a whole, it is a statistical statement and model validation.

2. Model of the efficiency

As a starting point for creating the model, it was acknowledged that to apply the idea of comprehensive efficiency in the sphere of small business management, it is necessary to change how it is understood. Therefore, it was assumed that the main objective of an enterprise's activity is to maximise the value for the owners, i.e. to multiply their wealth. This general objective consists of a number of specific objectives which can be grouped as follows:

- growth of the enterprise - understood as an increase in the volume of production and, consequently, sales, i.e. manufacturing efficiency,
- development of the enterprise - understood as the introduction of new products and expansion of operations into new markets, i.e. effectiveness of market activities,
- making profits - understood as gaining funds for both the growth and development of the enterprise, i.e. the economic efficiency of activities.

For this reason, the author of the book assumed that important aspects influencing efficiency are:
- correct estimation of future expenditures - economic efficiency,
- performance of previously planned tasks - manufacturing efficiency
- the expediency of outlays; outlays incurred are adequate for implementation, and the objective achieved by the outlays incurred determines the effectiveness.

The presented objectives are key to achieving the organisation's overarching objective of increasing the value of the enterprise. Therefore, from the perspective of management theory and business practice in the case of micro and small enterprises, it seems justified to modify the organisation's objectives from the point of view of efficiency and market success (Table 23).

Table 23. Objectives of the small enterprise

Overarching objective of the business	Levels of efficiency	Main objectives	Specific objectives	Management objectives
Maximising the owner's wealth, increase in the value of the SME company	Economic efficiency	Result	Profitability = Maximise profit	Cost optimisation
				Maximising revenue
			Liquidity = Optimisation of the operating cash level in circulation	Receivables
				Liabilities
				Stock
	Manufacturing efficiency	Growth	Productivity = Ability to make use of resources	New products
				Investment in development
	Effectiveness	Development	Optimisation of market positioning strategy = Strengthening market position	Satisfying customer requirements and needs
				Advertising and marketing

Source: Own elaboration.

Therefore, the efficiency management process itself will be divided into the three areas to be managed - results, growth and development. Success considered in this way from the point of view of the efficiency model results in multiplication of its many dimensions. For this reason, the efficiency of small enterprises should be considered together as a triad of relationships between the three components: economic efficiency, manufacturing efficiency and effectiveness of operations, which are defined as follows:
- economic efficiency - an action where the result obtained exceeds the expenditure incurred to obtain it

- the organisation's manufacturing efficiency, i.e. performance in the context of the original meaning of the term as a feature of the operation - the proper performance of something in the given time
- effectiveness - an action that leads to the market effect intended as an objective.

Therefore, taking into account the importance of managing the success and efficiency of small enterprises, the book attempts to solve the research problem of creating a *model of efficiency research.*

3. Mathematical model of the efficiency construct

The efficiency of an enterprise is a continuous cycle of its components.

$$Ee_0 \rightarrow Me_0 \rightarrow En_0 \rightarrow Ee_1 \rightarrow Me_1 \rightarrow En_1 \rightarrow Ee_2 \rightarrow \cdots$$

Where:

$Ee - Economic\ efficiency$

$Me - \ Manufacturing\ efficiency$

$E_n - Effectiveness$

The moment of entry in the business register is considered to be the beginning of business activity. At the outset, an enterprise generally has some initial capital, which determines its economic efficiency. This capital leads to the accumulation of resources, the consumption of which determines manufacturing efficiency. The growth of the organisation determines its effectiveness on the market. The return from the market determines the economic efficiency of the new cycle, etc.

The enterprise is set up to exist indefinitely, so there is no possibility of a time limit here. The efficiency triangle cycle runs from the moment the enterprise is established - moment 0, to the subsequent cycles in time – $t = 1,..., n$.

The efficiency triangle (Figure 5) is exposed to external factors determining the efficiency at a specific point in time t.
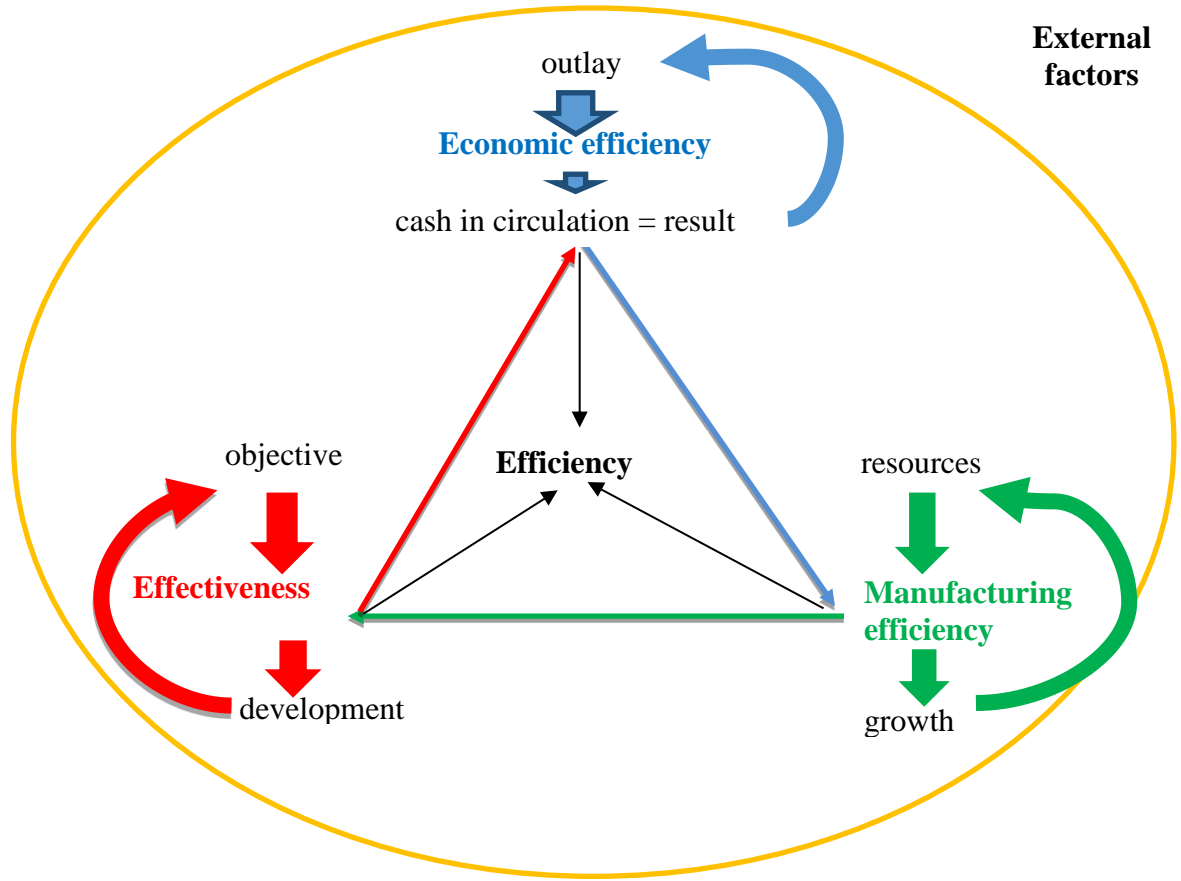
Figure 5. Model of the efficiency triangle in time t

Source: Own elaboration.

The basic assumption of the model is to present the efficiency of each company at moment t as a point $E_f = (E_e, M_e, E_n)$ in the Cartesian reference system (three-dimensional space).

The position in space R^3 of each efficiency point is determined (designated) by a set of ordered components:

$$R^3 = \{(E_e, M_e, E_n): E_e, M_e, E_n \in R\}$$

The measure of efficiency can be defined as the length of the vector determined on the basis of the previously discussed parameters (E_e, E_n, M_e). The length of the efficiency vector is expressed as (Euclidean standard):

$$\|E_f\| = \sqrt{e_e + m_e + e_n}$$

$\|E_f\|$ - the length of the vector (non-negative value),

e_e- square of the length of the economic efficiency component at moment/time t, determined as a change in the economic efficiency value:

$$e_e = (E_{e_t} - E_{e_{t-1}})^2$$

m_e- square of the length of the manufacturing efficiency component at moment/time t, determined as a change in the economic efficiency value:

$$m_e = (M_{e_t} - M_{e_{t-1}})^2$$

e_n- square of the length of the effectiveness component at moment/time t, determined as a change in the economic efficiency value:

$$e_n = (E_{n_t} - E_{n_{t-1}})^2$$

Therefore, for the first step/cycle/run, the length of the vector determining the efficiency value can be presented as:

$$\|E_f\| = \sqrt{(E_{e_1} - E_{e_0})^2 + (M_{e_1} - M_{e_0})^2 + (E_{n_1} - E_{n_0})^2}$$

$E_{e_0} E_{n_0} M_{e_0}$ the initial values are 0.

At $t = 0$ the company has no value yet; this is the moment of initiation of business activity, equal to the moment of entry in the register, therefore:

$$\|E_f\| = \sqrt{E_{e_1}{}^2 + M_{e_1}{}^2 + E_{n_1}{}^2}$$

Such a description of an enterprise's efficiency seems to be accurate due to the fact that there is statistical evidence in the source literature which generalises the characteristics of vectors for a multidimensional case, as well as presentation of their selected properties

Assumptions:
1) All of the components of efficiency are interconnected.
2) The vectors of economic efficiency, effectiveness, and manufacturing efficiency are linearly independent.
3) At $t = 0$ the efficiency vector components are equal to 0.

Finally, the thematic diversity and complex nature of the phenomena that are the focus of this monograph should be stressed. Apart from its scientific value, the book also has a practical dimension.